

## **REMARKS**

### **I. Amendments**

The Applicant is presenting amendments herein which the Applicant believes places the claims in condition for allowance and overcomes the rejections set forth in the final office action dated July 19, 2006.

### **II. Claim Rejections 35 U.S.C. § 102**

#### ***Requirements for Prima Facie Anticipation***

A general definition of *prima facie* unpatentability is provided at 37 C.F.R.

§1.56(b)(2)(ii):

A *prima facie* case of unpatentability is established when the information *compels a conclusion* that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability. (*emphasis added*)

"Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundsciber Corp. v. United States*, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). Thus, to anticipate the applicants' claims, the reference cited by the Examiner must disclose each element recited therein. "There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991).

To overcome the anticipation rejection, the Applicant needs to only demonstrate that not all elements of a *prima facie* case of anticipation have been met, *i.e.*, show that the prior art reference cited by the Examiner fails to disclose every element in each of the applicants' claims. "If the examination at the initial state does not produce a prima face case of unpatentability, then without more the applicant is entitled to grant of the patent." *In re Oetiker*, 977 F.2d 1443, 24 USPQ 2d 1443, 1444 (Fed. Cir. 1992).

### ***Nagahara***

Claims 1, 2, 3, 6, and 7 were rejected by the Examiner under 35 U.S.C. 102(b) as being anticipated by Nagahara, "Direct Placement of Suspended Carbon Nanometer-scale Assembly" hereinafter referred to a Nagahara.

Applicant notes that Nagahara provides no teaching of a neural network and/or an artificial physical neural network as taught by Applicant's invention. Nagahara also does not provide for any teaching of a synapse or other such neural network components as taught by Applicant's invention. The mere presence of electrodes and carbon nanotubes as taught by Nagahara does not result in the anticipation of an artificial physical neural network as taught by Applicant's invention, including neural network components such as neuron.

Simply because Nagahara teaches electrodes does not mean that such electrodes are components of a neural network. Merely citing Nagahara and stating that "the distance between electrodes is the synapse" does not indicate that this is so. There is simply no teaching of a synapse or a neuron in Nagahara or of any type of neural network activity other such neural network components. A neuron, a synapse, and a neural network are sophisticated components of which there is no teaching in Nagahara. Nagahara simply does not provide for any teaching of a neural network of any sort.

Nagahara also does not provide for a teaching of a dielectric liquid solution as taught by Applicant's invention and a neural network based on neural network connections formed from nanoconductors disposed and free to move about within a dielectric liquid solution comprising a mixture of a plurality of nanoconductors and a dielectric solvent.

Additionally, Nagahara does NOT disclose, suggest or teach ALL of the following claim limitations: locating said dielectric liquid solution within a connection gap formed between said at least one pre-synaptic electrode and said at least one post-synaptic electrode, wherein each nanoconnection among said plurality of nanoconnections is strengthened or weakened according to an application of said electric field, such that the greater an electrical frequency or an amplitude of said electric field, the more nanoconductors among said plurality of nanoconductors align to form said plurality of nanoconnections and the stronger said artificial physical neural network thereof becomes, and wherein nanoconnections among said plurality of nanoconnections that are not strengthened and thus not utilized by said artificial physical neural network are dissolved back into said dielectric liquid solution and nanoconnections among said plurality of nanoconnections that are utilized more frequently by said artificial physical neural network are strengthened;

In order to anticipate claims 1, 3, 4, 6, and 7, Nagahara must actually disclose an artificial physical neural network and a dielectric liquid solution (as taught by Applicant's invention). Nagahara mentioned briefly the use of Triton X-100. A solution of 1% or 2% of Triton X-100, however, does not teach, suggest or disclose all of the following: a dielectric liquid solution comprising a mixture of a dielectric solvent and a plurality of nanoconductors. Triton X-100 is typically used as surfactants to break surface tension on wafers during a BOE wet etch. The most common use in the lab is aid in the etching of oxide for small features. How does Triton X-100 comprise a dielectric? There is no teaching in Nagahara of Triton X-100

constituting a dielectric, or for that matter, no teaching of all of the following claim limitations: a dielectric liquid solution comprising a mixture of a dielectric solvent and a plurality of nanoconductors. How does Triton X-100 teach or suggest a dielectric liquid solution comprising a mixture of a dielectric solvent and a plurality of nanoconductors?

The Applicant respectfully requests that the Examiner identify which specific components of Nagahara disclose an artificial and physical neural network as taught by Applicant's invention. The Examiner should also explain how and why Triton X-100 constitutes a dielectric and how it is used in Nagahara as a dielectric. There is also no teaching in Nagahara of Triton X-100 constituting ALL of the following features: a dielectric liquid solution comprising a mixture of a dielectric solvent and a plurality of nanoconductors.

Nagahara only teaches the direct placement of suspended carbon nanotubes for nanometer-scale assembly provides no teaching whatsoever of a neural network. "The distance between electrodes" of Nagahara does *not* suggest, teach or disclose a neural network or any type of neural network whatsoever. Nagahara at page 3826, C1:35 to C2:8 in particular provides absolutely no teaching or suggestion of a neural network. The rejection based on Nagahara fails under the aforementioned prima facie anticipation test because Nagahara fails to disclose every element in each of Applicant's rejected claims. For example, Nagahara fails to teach a neural network. Nagahara also fails to teach neural network components such as neurons, synapses etc. Nagahara also fails to teach the liquid dielectric solution of Applicant's claims.

Because Nagahara does not disclose any neural networks and fails to disclose neural network components disposed and free to move about within a dielectric liquid solution comprising a mixture of a dielectric solvent and nanoconductors, Nagahara does not anticipate claims 1, 3, 4, 6, and 7.

Nagahara therefore does not anticipate claims 1, 2, 3, 6 and 7 under 35 U.S.C. 102(b). Applicant respectfully requests withdrawal of the rejection to claims 1, 2, 3, 6 and 7 based on Nagahara.

### **III. Claim Rejections – 35 U.S.C. § 103**

#### ***Requirements for Prima Facie Obviousness***

The obligation of the examiner to go forward and produce reasoning and evidence in support of obviousness is clearly defined at M.P.E.P. §2142:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

M.P.E.P. §2143 sets out the three basic criteria that a patent examiner must satisfy to establish a *prima facie* case of obviousness:

1. some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
2. a reasonable expectation of success; and
3. the teaching or suggestion of all the claim limitations by the prior art reference (or references when combined).

It follows that in the absence of such a *prima facie* showing of obviousness by the Examiner (assuming there are no objections or other grounds for rejection), an applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443 (Fed. Cir. 1992). Thus, in order to support an obviousness rejection, the Examiner is obliged to produce evidence compelling a conclusion that each of the three aforementioned basic criteria has been met.

### ***Nagahara in view of Mehrotra***

Claims 5 and 8 were rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Nagahara, as set forth above, in view of Mehrotra, "Elements of Artificial Neural Networks").

The Applicant notes that claims 5 and 8 have been cancelled by amendment as indicated herein. Therefore, the Examiner's arguments with respect to claims 5 and 8 are rendered moot.

### ***Nagahara, Mehrotra, Olson***

Claims 9 and 10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahara in view of Mehrotra, and further in view of Olson "Startup Combines Nanotechnology With Neural Nets".

Regarding claims 9 and 10, the Applicant notes again that Nagahara provides no teaching or hint of a neural network and neural network components such as synapses and electrodes. Nagahara also does not provide for any teaching of neural network activity via neural network devices such as synapses and neurons. Additionally, as indicated above, Nagahara does not provide for any teaching of a dielectric liquid solution comprising a mixture of a dielectric solvent and a plurality of nanoconductors. As stated previously, Nagahara also does not provide for any teaching of locating said dielectric liquid solution within a connection gap formed between said at least one pre-synaptic electrode and said at least one post-synaptic electrode, wherein each nanoconnection among said plurality of nanoconnections is strengthened or weakened according to an application of said electric field, such that the greater an electrical frequency or an amplitude of said electric field, the more nanoconductors among said plurality of nanoconductors align to form said plurality of nanoconnections and the stronger said artificial physical neural network thereof becomes, and wherein nanoconnections among said plurality of

nanoconnections that are not strengthened and thus not utilized by said artificial physical neural network are dissolved back into said dielectric liquid solution and nanoconnections among said plurality of nanoconnections that are utilized more frequently by said artificial physical neural network are strengthened.

Regarding the Olson reference, the Applicant conceived of the subject matter of Olson to the extent this novel concept may be claimed in claims 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22.

The Applicant submits again herewith a declaration by Alex Nugent (hereinafter referred to as the "Nugent declaration") to antedate the effective date of September 18, 2002 of the Olson reference, in accordance with 37 C.F.R. §1.131(a). The Examiner indicated that the prior declaration was improper. In order to correct any deficiency that may have been present in the previously submitted declaration, Applicant is submitted an updated declaration (again, referred to as the "Nugent declaration"). Note that this same Nugent declaration was submitted previously in response to the final rejection dated July 19, 2006. The Nugent declaration is, however, being submitted again along with the appropriate Exhibits.

The Nugent declaration is accompanied by Exhibit A forming part thereof that evidences both conception of the invention by Applicant prior to the effective date of September 18, 2002 of the Olson reference.

Exhibit A of the Nugent declaration provides copies of U.S. published Patent Application No. US20030177450 (i.e., U.S. Patent Application No. 10/095,273 filed on March 12, 2002) and U.S. Patent No. 6,889,216. These patent documents establish conception and constructive reduction to practice of the key element of the Olson invention prior to the effective date of September 18, 200 of the Olson reference. U.S. Patent Application Serial No. 10/095,273 discloses a technique of self-assembly to form connections in a dielectric solution, where electrical fields can

be used to strengthen or weaken certain connections for use in dense and sophisticated arrays of neural "synapse" connections, which is the same technique/system described in the Olson reference.

U.S. Patent No. 6,889,216 is the issued version of the patent application of U.S. published Patent Application No. US20030177450. The patent application and patent shown in Exhibit A establish conception and constructive reduction to practice (via filing of the application) prior to the effective date of September 18, 2002 of the Olson reference. That is, U.S. Patent Application Serial No. 10/095,273 was filed on March 12, 2002, which is before the effective date of September 18, 2002 of the Olson reference. Reduction to practice (and hence conception) are established as of the filing date of the application.

The Nugent declaration also includes Exhibit B, which evidences Applicant's ownership of KnowmTech, LLC. The Applicant submits that "KnowmTech, LLC" is actually the company referred to incorrectly as "LowmTech" by the Olson reference. The Applicant believes that the author of the Olson reference incorrectly referred to Applicant's company "KnowmTech, LLC" as "LowmTech, LLC". The Applicant believes that this was merely a spelling mistake on the part of the author of the Olson reference. Exhibit B contains some of the "Limited Liability Company" document for KnowmTech, LLC that were prepared and filed with the State of New Mexico in 2002. A review of these documents indicates that Alex Nugent is a co-owner and the President of KnowmTech, LLC, which is the owner and assignee of U.S. published Patent Application No. US20030177450 (i.e., U.S. Patent Application No. 10/095,273 filed on March 12, 2002) and U.S. Patent No. 6,889,216 shown in Exhibit A of the Nugent declaration.

Therefore, given the Nugent declaration and Exhibits A and B thereof, important subject matter of claims 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 that distinguishes Applicant's claimed invention over the cited art, was conceived and reduced to practice via a patent filing by Applicant prior to the effective date of



September 18, 2002 of the Olson reference. Therefore, Olson cannot be used to obviate claims 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22. Applicant respectfully requests that the rejection to claim 9 (and claims 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22) be withdrawn. The Applicant also requests withdrawal of the use of the Olson reference.

***Nagahara, Mehrotra, Olson, Tapang***

Claims 11 and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Nagahara, Mehrotra, and Olson, as set forth above, and further in view of Tapang (U.S. Patent No. 4,926,064).

Applicant notes that the arguments presented above against the rejection to claims 9 and 10 apply equally against the rejection to claims 11 and 12. Based on the foregoing, the Applicant submits that the rejection to claims 11 and 12 has been traversed. The Applicant therefore respectfully requests withdrawal of the rejection to claims 11 and 12.

***Olson, Mehrotra***

Claims 13, 15, 16, 17, 21, and 22 were rejected by the Examiner under 35 U.S.C 103(a) as being unpatentable over Olson in view of Mehrotra. Again, as indicated above, Olson should be removed as a prior art reference (see the Nugent declaration). Thus, the reference to claims 13, 15, 16, 17, 21, and 22 is traversed. Applicant respectfully requests withdrawal of this rejection.

***Olson, Mehrotra, Nagahara***

Claims 14, 18, 19, and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Olson and Mehrotra, as set forth above, in view of Nagahara. Again, as indicated above, Olson should be removed as a prior art reference (see the Nugent declaration included herewith). Thus, the reference

to claims 14, 18, 19, and 20 is traversed. Applicant respectfully requests withdrawal of this rejection

#### **IV. Conclusion**

In view of the foregoing discussion, the Applicant has responded to each and every rejection of the Official Action. The Applicant has clarified the structural distinctions of the present invention via the amendments and remarks presented herein. The Applicant submits that the amendments provided now place the application in condition for allowance. Applicant also respectfully requests withdrawal of the rejections under 35 U.S.C. §102 and §103 based on the preceding remarks. Reconsideration and allowance of Applicant's application is therefore respectfully solicited.

Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact the undersigned representative to conduct an interview in an effort to expedite prosecution in connection with the present application.

Respectfully submitted,

A handwritten signature in cursive script that reads "Kermit Lopez". The signature is written in black ink and is positioned above a horizontal line.

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